



THREATS

Threats to natural resources in parks are as varied as the parks themselves. Urban encroachment, water quality and quantity issues, air pollution, and human activities are responsible for most external threats. Internally, inholdings and commercial development in parks, nonnative wildlife or plant species, illegal activities such as poaching, and improperly controlled recreational uses threaten parks. Unchecked, threats degrade resources and lead to a loss of park values: scenic views diminish, streams become polluted, habitat is destroyed, and biodiversity declines. As world population increases, so do threats. However, strategic efforts targeted at specific threats may help stop them. For example, the National Park Service took steps during 1997 to address the threat of invasive nonnative plant species. These efforts included helping to develop interagency and private-sector partnerships, educational activities, and local management actions that prevent the introduction of invasive species, control those already present, and restore affected areas.

Joshua Tree dodges a bullet: the Eagle Mountain landfill

by Jacob Hoogland

When Congress passed the Desert Protection Act in 1994, it expanded the boundary of Joshua Tree National Park (California) toward the rim of an inactive open-pit iron mine. The new lands included in the park expansion were carved from those administered by the Bureau of Land Management (BLM) and brought with them some land use controversies. One issue regarding the Park Service as a new neighbor to the inactive mine was the proposal to turn it into the world's largest landfill, accepting 10,000 tons of garbage daily by rail from Los Angeles and Orange Counties.

The landfill proposal previously was approved by Riverside County only to be turned back by a court action brought by environmental organizations.

Recognizing the possibility of future litigation and the potential for the proposal to be approved, Superintendent Ernie Quintana sought technical assistance from the Department of the Interior Office of the Solicitor and the NPS Natural Resource Program Center in addressing some of the issues.

The proposal itself presented certain environmental benefits. A land exchange with BLM would provide for access to the mine; additional lands would provide for protection of desert tortoise habitat. Also, previous negotiations had provided for the establishment of a trust fund to mitigate environmental damage potentially arising from the landfill operation. The challenge to the Park Service was to provide for adequate mitigation of possible damages, while continuing to oppose the landfill based on principle.

To establish the scientific basis for evaluating the potential impacts of the landfill, Quintana convened a group of scientists and specialists with experience in

jacob_hoogland@nps.gov
Chief, Environmental Quality
Division, Natural Resource Program
Center, Washington, D.C.

 Parks with oil fields nearing depletion and those in oil and gas producing areas began seeing renewed industry interest in oil exploration during 1997. An advance in oil exploration seismic technology, called 3-D seismic, has opened up older oil fields in parks to new exploration, with both low and high-impact techniques.

(Photo) Located 1½ miles from designated wilderness within Joshua Tree National Park (California), the inactive Eagle Mountain iron mine (foreground) is the proposed site of the world's largest landfill, now on hold following a tentative court ruling.



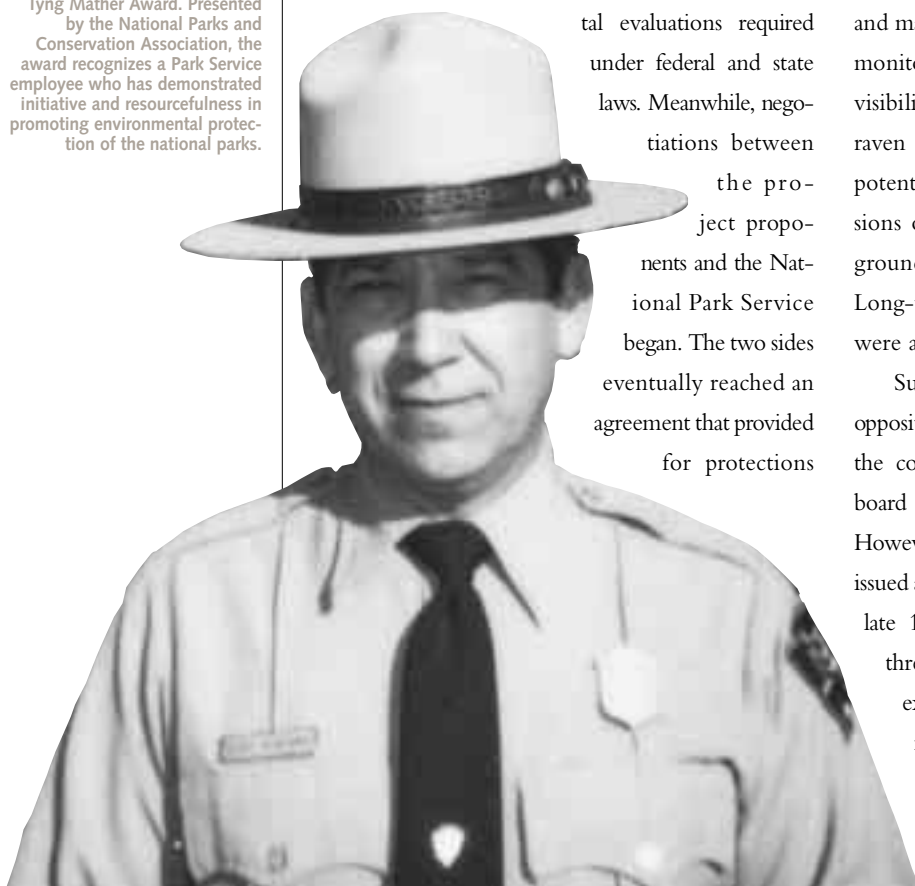
\$65 million was made available for federal acquisition of Crown Butte Mining's New World Mine holdings as part of the Interior appropriations bill signed by President Clinton in November. In keeping with his August 1996 announcement from Yellowstone National Park, this funding will effectively halt construction of the controversial New World Mine located northeast of the park.



Joshua Tree National Park

In the proposal for the landfill, the inactive open-pit mine would receive 10,000 tons of garbage daily by rail from Los Angeles and Orange Counties.

For his efforts in protecting the park, Superintendent Ernie Quintana received the Stephen Tyng Mather Award. Presented by the National Parks and Conservation Association, the award recognizes a Park Service employee who has demonstrated initiative and resourcefulness in promoting environmental protection of the national parks.



landfill impacts. This group surveyed the potential impacts and provided information on what possible mitigation measures could be implemented and the likelihood of the anticipated impacts. During this time the National Park Service joined with the BLM and Riverside County in the preparation of environmental evaluations required under federal and state laws. Meanwhile, negotiations between the project proponents and the National Park Service began. The two sides eventually reached an agreement that provided for protections

to the park if state and local authorities approved the project. Among the many provisions, the agreement stipulated that the project developers convey to the government all mining claims they owned that were located within the park. It required them to minimize odor during the operation of the project, to install and maintain a visibility monitoring station and other monitoring equipment, and to maintain night sky visibility. The agreement directed them to monitor raven and other predator populations and mitigate potential increases in these populations. Other provisions of the agreement related to the protection of groundwater and monitoring of ambient noise. Long-term research and public education programs were also indicated.

Superintendent Quintana continued to voice opposition to the project at public hearings held during the county review process. Nonetheless, the county board of supervisors approved the landfill operation. However, a San Diego County superior court judge issued a tentative ruling rejecting the proposed landfill in late 1997, indicating that the proposal presented a threat to the desert tortoise and to the wilderness experience of the park. The future of the proposal is undetermined, as is the land exchange with the BLM to enhance desert tortoise habitat that was part of the original proposal.

Internal Threats

Underwater resource damaged by recreational boating

by Bob Dusek and Karen Battle

During 1997, 161 vessels ran aground in Biscayne National Park (Florida) damaging 8,000 square meters of submerged seagrass (*Thalassia testudinum*) beds. This ecosystem is one of the most productive in the world, and Biscayne has many rich and healthy seagrass communities, some with as many as 400 shoots per square meter. A refuge and nursery for numerous commercial and sport marine species, seagrass beds also stabilize sediments, reduce wave energy, and filter organic and metallic compounds from the water.

Despite regulations that protect these resources, motorboats are seriously damaging seagrass communities. Although park groundings in 1997 numbered 15% fewer than in 1996, the area damaged was more than double in size; just two incidents accounted for almost 2,000 square meters of damage. As boats travel into shallow water, their propellers cut the grass beds, in many cases trenching the bottom, removing all grass blades, rhizomes, and even sediment. In rare instances boats may excavate holes more than a meter deep and displace more than 20 cubic meters of sediment. All of Biscayne's shallow water shoals show some degree of propeller scarring.

Once grass rhizomes are damaged, natural recovery often takes three to ten years. Damaged sites can be restored by refilling the scars and then replanting.

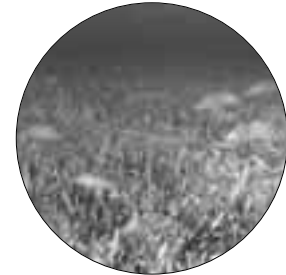
However, restorations outside the park have had little success. Biscayne's best seagrass protection tool is education. Boat operators often do not understand the ecological importance of seagrass communities; also, once they have run aground, they may not know how to get out of a seagrass bed without causing further damage.

Without an entrance gate to distribute educational literature, Biscayne has had to develop an education program targeting boaters. Through this program, recreational boaters and commercial operators are now learning the importance of the seagrass communities, the level of destruction caused by inattentive boat operation, and how to safely get off the shoals. In addition, contractual arrangements with park commercial tow-boat operators require that they report grounded vessels and, in some cases, mark grounding sites. These commercial contractors operate under strict guidance for vessel removal designed to minimize damage.

The park has also identified heavily impacted areas so that additional navigational aids can be installed. Nine new pilings with large warning signs will be in place by early 1998. Moreover, the U.S. Coast Guard will be improving its marking of channels based on park grounding data. Meanwhile, the park has been working closely with the NPS Environmental Quality Division and the Department of the Interior regional Office of the Solicitor to recover monetary damages through the Park System Resource Protection Act for site restoration, boater education, and protection of undamaged seagrass resources. During 1998, the park hopes to begin site restoration after many of the civil suits are settled.

robert_dusek@nps.gov
Supervisory Biological Technician;
Biscayne National Park, Florida.

karen_battle@nps.gov;
Biological Technician; Biscayne
National Park, Florida.



Biscayne National Park

A highly productive park ecosystem, seagrass beds are nurseries for numerous commercial and sport marine species. As boats travel into shallow waters, their propellers cut the grass beds, in many cases trenching the bottom, removing all grass blades, rhizomes, and even sediment.



Biscayne National Park, A. Geller

Motorboat propeller scars crisscross shallow seagrass beds at Biscayne National Park (Florida). During 1997, 161 vessels ran aground damaging 8,000 square meters of the biologically diverse submerged habitat.

Sue Jennings

(Contact: randy_ferrin@nps.gov)
Former Resource Management
Specialist; Saint Croix National
Scenic Riverway, Wisconsin.

Award Winner Profile

Ken Czarnowski honored for warding off threats

The 1996 Director's Award for Natural Resource Management was awarded to Ken Czarnowski, Hydrologist at Rocky Mountain National Park, Colorado, in August. This award recognizes outstanding contributions to technical expertise, continuity, and innovative thinking in resource management. Through his creativity and persistence, Czarnowski has resolved numerous complex natural resource issues at the park, primarily those dealing with water rights. For example, he negotiated with the Bureau of Reclamation and other parties to redirect water back into a park drainage, providing for natural park processes and restoring a high altitude park wetland. Working with the Office of the Solicitor, the Department of Justice, and the NPS Water Resources Division, Czarnowski developed agreements to protect the park from future litigation on water issues. Additionally, Czarnowski's broad understanding of park resources, negotiation skills, and ability to work with attorneys and technical staff from other agencies have helped to address aircraft overflight issues at the



Ken Czarnowski, winner of the 1996 Director's Award for Natural Resource Management.

Exotic Species

Zebra mussels move upstream in the St. Croix River

by Sue Jennings

No bigger than a fingernail, the zebra mussel (*Dreissena polymorpha*) is capable of inflicting serious damage to the ecology, economy, and recreational uses of the St. Croix National Scenic Riverway (Wisconsin and Minnesota). Despite a five-year quarantine program designed to keep the species from gaining a foothold within the riverway, resource managers discovered 40 juvenile zebra mussels in a new part of the park last July. The species had previously been detected only on boats moored in the Lower St. Croix River, downstream from a hydroelectric dam. This time they were attached to a mussel-sampling station suspended in the river 2 miles upstream of the dam and several miles upstream of the only known population of the federally endangered winged mapleleaf mussel (*Quadrula fragosa*).

The discovery posed a number of immediate threats. The park supports a world-class mussel fauna, including several state and federally listed species, and a large fishery. Zebra mussels can wipe out native freshwater mussels by blocking their feeding, respiration, and reproductive structures. As a result of their enormous filtering abilities, zebra mussels remove large quantities of phytoplankton ordinarily consumed by fish. Divers could possibly remove a small population of zebra mussels; however, any undetected population could expand rapidly, altering the structure and function of the ecosystem.

The park's first response was to conduct SCUBA-diver searches and other monitoring, but no additional zebra mussels were found. As a result, the Zebra Mussel Task Force (an interagency group formed in 1992 to address the problem) proposed to draw down the water level behind the dam and systematically search the river. The exposure of an additional 6 feet of riverbed along 20 miles of riverbank would increase visibility and help



1997, St. Paul Pioneer Press, Joe Odun, Photographer

Crews assembled along the rocky shoreline of the St. Croix River (Minnesota and Wisconsin) last fall in the latest effort to stall the spread of zebra mussels into the national scenic riverway. Their task: to inspect a 20-mile stretch of the river for the nonnative mussel and remove those found.

the park and its partners assess the situation in time to develop a mitigation strategy before spring spawning.

Wearing rubber boots and armed with nets, buckets, and clipboards, searchers combed the shoreline on both sides of the river in late September. Crews rescued stranded fish and other organisms and moved thousands of native mussels into deeper waters. However, no zebra mussels were located. The large numbers of native mussels that were exposed, particularly to unusually warm temperatures, prompted the task force to return the water levels to normal and abandon the search one week after it began. Consensus is that the July find was a chance event, perhaps from an isolated population that had gone undetected or reached the location by a contaminated boat that was transported beyond the dam by trailer. Other possible sources include contaminated bailing bucket water and deliberate introduction. Exposure has occurred. However, no evidence of a self-sustaining population upstream or downstream of the site has been found, and the riverway is still considered uninfested.

The park will continue to protect its resources from a zebra mussel infestation in 1998, relying heavily on education, boater compliance, and early detection. This will require additional support from the task force, local communities, and others. It will certainly be a race against time: in September, resource managers discovered successful reproduction of the endangered winged mapleleaf for the first time in several years, providing hopes for its recovery.

Ball pythons on Maui?

by Lloyd Loope

The September 1997 capture of a ball python (*Python regius*) near Haleakala National Park and the appearance of its picture on the front page of *The Maui News* is symbolic of movement toward a paradigm change for this Hawaiian island and the park. Concerns regarding invasions of alien pest species are now taken very seriously by local people.

Native to central and west Africa and popular in the international pet trade, the snake was captured in a garage in Makawao, just 7 miles from the park. The python's capture and a rash of other recent snake sightings in nearby sugar cane fields has led several local agencies, led by the Hawaii Department of Land and Natural Resources, to collaborate in a night road survey and trapping effort to try to determine whether snakes are on the verge of establishment and what response may be appropriate. Meanwhile, the understaffed and harried Hawaii Department of Agriculture, which is responsible for front-line prevention of introductions, dismisses the recent snake reports as "hysteria" and focuses on imposing a \$25,000 fine in the few cases where snake owners can be apprehended.

The biotas of oceanic islands in general, and the Hawaiian Islands in particular, are highly susceptible to damage caused by alien plants and animals transported by humans. Freed from the natural predators and parasites of their native habitats, invaders often thrive in newly occupied environments. The case of the brown tree snake (*Boiga irregularis*) on the island of Guam is illustrative. Forty years after arrival, it had attained population densities of 10,000–30,000 per square mile, feeding on birds, rats, shrews, and lizards; it had also exterminated nine of Guam's 12 native forest birds and approximately half the native lizard fauna and left the three surviving forest bird species and remaining fruit bat highly endangered. The threat if this snake species were to establish in Hawaii is now well recognized. What is not so widely recognized is that many other biological generalist snake species, including many of those commonly kept as pets, are

very likely to respond to new island habitats (such as Maui) in a very similar way. Citizens of Maui increasingly sense that establishment of snakes and other pests threaten not only the native biota, but also tourism, agriculture, and the local quality of life.

The Haleakala National Park Superintendent and the USGS Biological Resources Division office recognize the paramount importance of such insidious threats from outside park boundaries. Together, they have been waging a campaign for eight years, culminating in late 1997 and early 1998, to call for effective antialien species measures at ports of entry in conjunction with expansion and internationalization of the local airport. Traditionally, the state and federal governments have demonstrated a lackadaisical, fatalistic attitude toward invasions into Hawaii. The U.S. Department of Agriculture has five times as many quarantine inspectors responsible for stopping pests from getting to the U.S. mainland from Hawaii as there are state inspectors responsible for stopping pests from getting into Hawaii! Superintendent Donald Reeser is insisting that this situation has to change if federal dollars are to be used to expand ports of entry to accommodate whatever pests the international economy may send to Maui. As 1997 ends, the Department of the Interior is asking the President's Council on Environmental Quality to participate in interdepartmental discussions to determine how to address this issue. One option is to make Kahului Airport "a pilot project with state-of-the-art mitigation measures as part of the Vice President's national effort to address invasive species."

lloyd_loope@usgs.gov

Research Scientist, Pacific Islands Ecosystem Research Center, Haleakala Field Station; USGS Biological Resources Division; Makawao, Maui, Hawaii.

Discovered near Haleakala National Park on Maui during September, the nonnative ball python poses a potentially serious threat to island fauna, especially native birds and lizards. Is the species on the verge of establishment? Trapping efforts may help answer this question, but effective antialien species measures at ports of entry remain a critical need.

Hawaii Department of Agriculture, Will Guerrero